

CLAIMS

What is claimed is:

1. In a microcontroller with an embedded processor, power supply and  
5 power on reset circuit, said processor and said power on reset circuit  
interconnectedly coupled, and said power supply interconnectedly coupled with said  
power on reset circuit and responsive to signals therefrom, a method of dynamically  
controlling a plurality of power stability functions for said microcontroller, said method  
comprising the steps of:

- 10 a) supplying a power state to said microcontroller from said power supply;  
b) sensing a power state condition of said power state;  
c) determining a suitability status of said power state condition;  
d) communicating said suitability status between said power on reset circuit  
and said processor;  
15 e) controlling certain functions of said microcontroller accordingly.

2. The method as recited in Claim 1, further comprising the step of:  
f) dynamically programming said power on reset circuit.

20 3. The method as recited in Claim 1, wherein said power supply is a  
switch mode pump.

4. The method as recited in Claim 2, wherein said power on reset circuit  
and said processor are interconnected via a bus.

25 5. The method as recited in Claim 4, wherein said step b) and said step  
c) are accomplished by said power on reset circuit.

6. The method as recited in Claim 5, wherein said step b) further comprises sensing a common supply voltage, wherein said common supply voltage is the voltage of said power state.

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7. The method as recited in Claim 6, wherein said step c) further comprises:

b1) generating a precision reference voltage;

b2) dividing said common supply voltage into a plurality of aspect voltages, each of said plurality of aspect voltages corresponding to separate voltage quantity, each separate voltage quantity an independent multiple of said common supply voltage;

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b3) forming a plurality of comparisons, each of said plurality of comparisons comparing one of said plurality of aspect voltages to said precision reference voltage; and

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b4) generating a plurality of power state condition signals, each of said plurality of power state condition signals corresponding to one of each of said plurality of comparisons.

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8. The method as recited in Claim 7, wherein said precision reference voltage is independent of said common supply voltage.

9. The method as recited in Claim 8, wherein said independent multiple of said common supply voltage is, selectively, fixed and programmable.

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10. The method as recited in Claim 9, wherein said step b2) is performed by a power supply scaler, wherein said power supply scaler comprises:

- a) a divider of said common supply voltage;
- b) a matrix of multiplexers and registers, and
- c) an interconnection to said bus.

5           11.    The method as recited in Claim 10, wherein said step d) and step f) are conducted via said bus.

12.    The method as recited in Claim 11, wherein said step f) is performed by said microprocessor, and further comprises the steps of:

- 10           f1) ascertaining a status of said microcontroller;
- f2) determining an optimal power state corresponding to said status;
- f3) programmatically calculating an optimal value for each programmable said independent multiple of said common supply voltage;
- f4) setting each said optimal value; and
- 15           f5) repeating said steps f1) through f4).

13.    The method as recited in Claim 12, wherein said step f4) further comprises:

- communicating each said optimal value to said power supply scaler
- 20    via said bus;
- registering each said optimal value with said matrix of multiplexers and registers;
- commanding said matrix of multiplexers and registers to change said independent multiple of said common supply voltage to correspond with said
- 25    optimal value; and
- monitoring said matrix of multiplexers and registers.

14. In a microcontroller, a system, said system comprising:

a power supply;

a bus;

a processor coupled to said bus; and a power on reset circuit, said processor

5 and said power on reset circuit coupled to said bus and interconnectedly coupled with said processor via said bus; and

power supply interconnectedly coupled with said power on reset circuit and responsive to signals therefrom;

said system executing a method of dynamically controlling a plurality of

10 power stability functions for said microcontroller, said method comprising the steps of:

a) supplying a power state to said microcontroller from said power supply;

b) sensing a power state condition of said power state;

c) determining a suitability status of said power state condition;

15 d) communicating said suitability status between said power on reset circuit and said processor via said bus;

e) controlling certain functions of said microcontroller accordingly; and

f) dynamically programming said power on reset circuit via said bus.

20 15. The system as recited in Claim 14, wherein said step b) and said step c) of said method are accomplished by said power on reset circuit.

16. The system as recited in Claim 15, wherein said step b) of said method further comprises sensing a common supply voltage, wherein said common  
25 supply voltage is the voltage of said power state.

17. The system as recited in Claim 16, wherein said step c) of said method further comprises:

b1) generating a precision reference voltage, said precision reference voltage independent of said common supply voltage;

b2) dividing said common supply voltage into a plurality of aspect voltages, each of said plurality of aspect voltages corresponding to separate voltage quantity, each separate voltage quantity an independent multiple of said common supply voltage;

b3) forming a plurality of comparisons, each of said plurality of comparisons comparing one of said plurality of aspect voltages to said precision reference voltage; and

b4) generating a plurality of power state condition signals, each of said plurality of power state condition signals corresponding to one of each of said plurality of comparisons.

18. The system as recited in Claim 17, wherein said step b2) of said method is performed by a power supply scaler, wherein said power supply scaler comprises:

a) a divider of said common supply voltage;

b) a matrix of multiplexers and registers, and

c) an interconnection to said bus.

19. The system as recited in Claim 18, wherein said step f) of said method is performed by said microprocessor, and further comprises the steps of:

f1) ascertaining a status of said microcontroller;

f2) determining an optimal power state corresponding to said status;  
 f3) programmatically calculating an optimal value for each  
 programmable said independent multiple of said common supply voltage;  
 f4) setting each said optimal value; and  
 5 f5) repeating said steps f1) through f4).

20. The method as recited in Claim 19, wherein said step f4) further  
 comprises:

communicating each said optimal value to said power supply scaler  
 10 via said bus;  
 registering each said optimal value with said matrix of multiplexers and  
 registers;  
 commanding said matrix of multiplexers and registers to change said  
 independent multiple of said common supply voltage to correspond with said  
 15 optimal value; and  
 monitoring said matrix of multiplexers and registers.

21. In a microcontroller having a power on reset circuit interconnected with a  
 processor, said microcontroller having a power state powered by a power supply,  
 20 said power supply interconnected with and responsive to control by said power on  
 reset circuit, a method of dynamically controlling said power state, said method  
 comprising the steps of:

a) ascertaining said power state;  
 b) programmatically determining desired changes to said power state;  
 25 c) intercommunicating between said processor and said power on reset  
 circuit;  
 d) adjusting said power on reset circuit corresponding to said desired changes

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